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Ten new taxa of chiropteran myobiids of the genus *Pteracarus* (Acarina: Myobiidae)*

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INTRODUCTION

The myobiid genus *Pteracarus* Jameson & Chow was erected for *Myobia chalinolobus* Womersley (the type species), *Myobia pipistrellia* Radford, *Myobia minuta* Radford and *Pteracarus tenax* Jameson & Chow (Jameson & Chow, 1952). Then, Dusbábek (1973) presented a precise definition and detailed morphology for the genus, together with the descriptions of 14 species and some subspecies within three named and seven unnamed taxa as well as keys to both sexes of all known species. Since the genus *Pteracarus* has proved to be associated with the bat families Vespertilionidae (one of the largest families), Miniopteridae and Thyropteridae, a large number of species of the genus are expected to occur in both the Old and New Worlds.

The present paper deals with the description of 10 new taxa. The nomenclature of dorsal setae on the idiosoma is basically the same as in Dusbábek (1973), although his female genital setae *pg*, g_1, g_2 and anal setae a_3 are regarded, in the present paper, as g_1, g_3, g_4 and g_7, respectively. Accordingly, the female genital and anal setae are thought to comprise $g_{1,3\text{-}7}$, exclusive of g_2, and *ae* and *ae*. Moreover, setae on the idiosomal venter are named following Fain (1973*a*). Numbers of setae and solenidia on tarsus I are five and four, respectively, instead of six and three as in Dusbábek (1973).

All the specimens recorded below were taken from bats deposited in the collections of the leading museums in Europe and the United States, and data for every specimen follows labels on its host in the respective museums. The abbreviations for the museums are as follows: BMNH—British Museum (Natural History), London; SMF—Forschungs-Institut Senckenberg, Frankfurt; MNHN—Muséum National d'Histoire Naturelle, Paris; AMNH—American Museum of Natural History, New York; USNM—U.S. National Museum of Natural History, Smithsonian Institution, Washington D.C; FMNH—Field Museum of Natural History, Chicago.

Measurements given in the text are in μm.

DESCRIPTIONS OF NEW MITES

I. Mites with a dorsal seta on genu IV (a total of 6 setae); *d*-series of setae complete (d_1–d_5) (Dusbábek, 1973), or d_4 and d_5 present in the female.

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Pteracarus hesperoptenis sp. nov.

FEMALE (Figs 1 & 2). Gnathosoma broad, wider than long. Idiosoma stout. Setae *vi* longer than *sc i*, barbed and fine distally; *ve, sc e* and l_1 very long; d_1–d_5 well developed; distance between d_1 and d_2 greater than between succeeding ones; d_5 situated on posterior-level of legs IV; ic_1 and 2 *cx* I minute; ic_2 and *cx* II_1 on sclerites; ic_4 and *cx* IV spiniform, on a sclerite; g_1 inferior in size to ic_4 and *cx* IV; g_3 and g_4 thinner than g_1; spermatheca not visible. Legs stout; leg I short and thick, with terminal claws; second claw on legs II–IV slightly smaller than first one; antero-lateral seta on trochanter, femur and genu of leg I spiniform. Chaetotaxy of gnathosoma, idiosoma and legs as in Figs 1 and 2; tarsus I with five setae and four solenidia, but setations on other segments as in Dusbábek (1973); dorsal setae on femur I and tibia IV long.

MEASUREMENTS. Body (= gnathosoma + idiosoma) 400 long, 245 wide; *vi* 20; *ve* 93; *sc i* 10; *sc e* 195; d_1, d_2, d_3, d_4 and d_5 33, 32, 38, 38 and 47, respectively; l_1 *ca.* 180; l_3 18; l_4 13; ic_4 22; *cx* IV 20.

MATERIAL EXAMINED. Holotype female ex *Hesperoptenus tomesi*, Malaya, date uncertain, in the collection of BMNH (Host accession Nos BM 74.455–6).

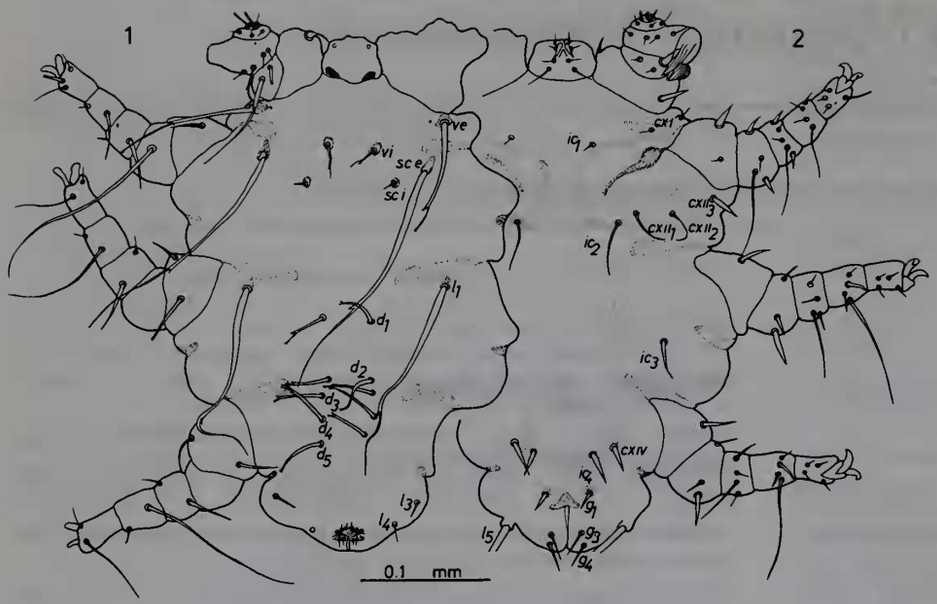
The holotype is deposited in the collection of the BMNH (BM 1987.9.9.1).

DIAGNOSIS. *Pteracarus hesperoptenis* sp. nov. is defined from a single female specimen on the basis of well-developed $d_{1\text{-}5}$ situated anterior to the posterolateral margin of legs IV and ventral sclerite bearing ic_4 and *cx* IV, characters not found in the other species. It is often difficult to identify an unknown sex when a species is described on the opposite sex, but the partner male of *P. hesperoptenis* should be easily recognized by the unique sclerite bearing ic_4 and *cx* IV.

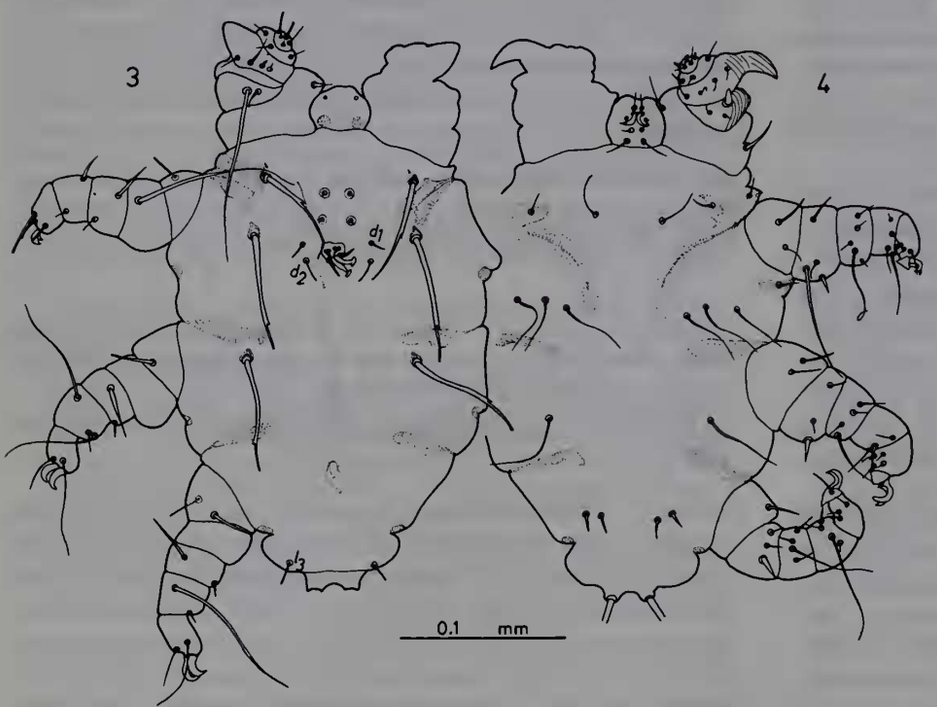
Pteracarus rhogeesis sp. nov.

MALE (Figs 3 & 4). Gnathosoma wider than long dorsally. Setae *vi* and *sc i* minute; *ve, sc e* and l_1 relatively short especially posterior to barb and ending abruptly; d_1 and d_2 conspicuous, probably apart from genital shield. Genital shield probably small; four pairs of genital setae visible; postero-median (= gm_1 in Dusbábek, 1973) thick and swollen apically; enis long. Ventral setae ic_4 and *cx* IV spiniform. Leg I with a pair of terminal claws; paired claws on legs II–IV subequal in size to each other; leg setae as in Figs 3 and 4.

MEASUREMENTS. Body 310 long by 200 wide; *vi* 3; *ve* 65; *sc i* 3; *sc e* 80; l_1 83; l_3 14; d_1 13; d_2 15; ic_4 15; *cx* IV 13; penis *ca.* 200.



Figs 1–2 *Pteracarus hesperoptenis* sp. nov.: **female** dorsum (1); venter (2).



Figs 3–4 *Pteracarus rhogeesis* sp. nov.: **male** dorsum (3); venter (4).

FEMALE (Figs 5 & 6). Gnathosoma as long as wide. Setae *vi* minute, longer than *sc i*; *ve, sc e* and l_1 short; d_1–d_3 vestigial; d_4 and d_5 short but conspicuous; l_3 thicker and longer than l_4. Ventral setae, legs and leg setae as in male (Figs 5 & 6). Spermatheca as in Fig. 5.

MEASUREMENTS. Body 400 (allotype) (370–400, 4 paratypes) long by 225(225–235) wide; *vi* 12(10–13); *ve* 85(78–88); *sc i* 8(5–7); *sc e* 88(85–93); d_4 13(12–15); d_5 13(14–17); l_1 78(75–83); l_3 25(23–28); l_4 15(15–22); ic_4 15(17–18); *cx* IV 16(15–17).

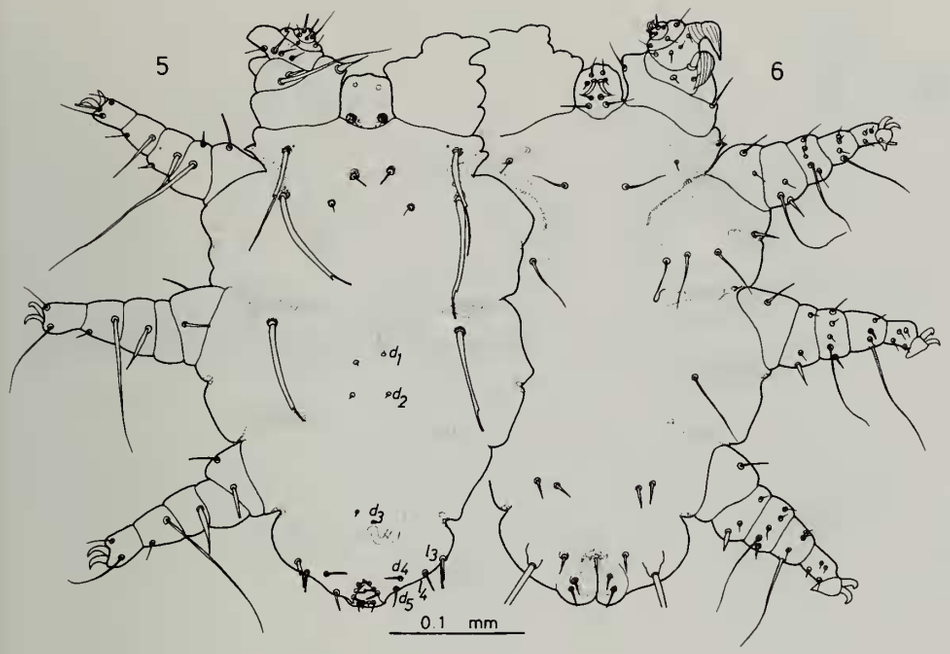
MATERIAL EXAMINED. Holotype male, allotype female and four paratype females ex *Rhogeesa tumida*, Avellana, Sta. Rosai, Guatemala, IV–1974 (AMNH 243952–5).

The holotype, allotype and a paratype are deposited in the collection of the Department of Entomology, AMNH, and two and one paratypes are in the collections of the BMNH (BM 1987.9.9.2–3) and the author, respectively.

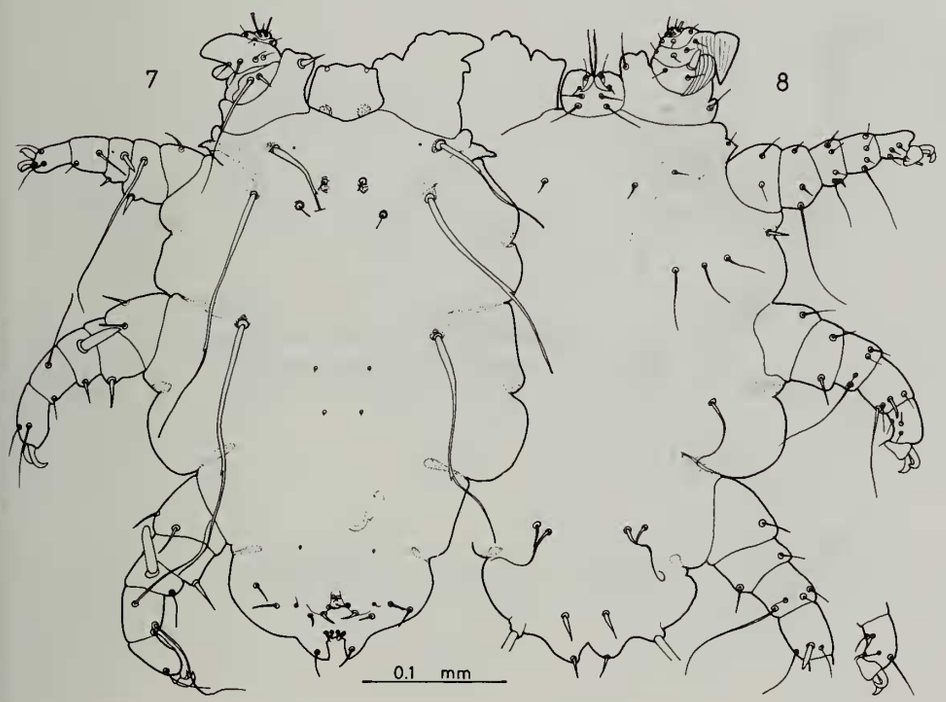
DIAGNOSIS. *Pteracarus rhogeesis* sp. nov. is characterized by the male genital shield bearing unique posteromedian setae that are boot-like and by short dorsal setae *ve, sc e* and l_1 in both sexes.

Pteracarus genualis sp. nov.

FEMALE (Figs 7 & 8). Gnathosoma pentagonal. Seta *vi* slightly thicker and shorter than *sc i*; *ve, sc e* and l_1 long; d_1–d_3 vestigial; d_4 inferior in size to d_5; *cx* II_3, spiniform; ic_4



Figs 5–6 *Pteracarus rhogeesis* sp. nov.: **female** dorsum (5); venter (6).



Figs 7–8 *Pteracarus genualis* sp. nov.: **female** dorsum (7); venter (8).

setiform and long; *cx* IV spiniform. Leg I broad and rather short, lacking terminal claws; dorsal seta on genua II–IV spiniform and not striated. Male unknown.

MEASUREMENTS. Body 420 long by 270 wide. Setae *vi* 11; *ve* 115; *sc i* 15; *sc e* 185; l_1 *ca.* 170; l_3 16; l_4 16; ic_4 more than 50; spines on genua II–IV 21 long by 5 wide, 35 × 9 and 33 × 8, respectively.

MATERIAL EXAMINED. Holotype female ex *Ia io*, Kiang-Si, China, date uncertain (BM 2512.6.2).

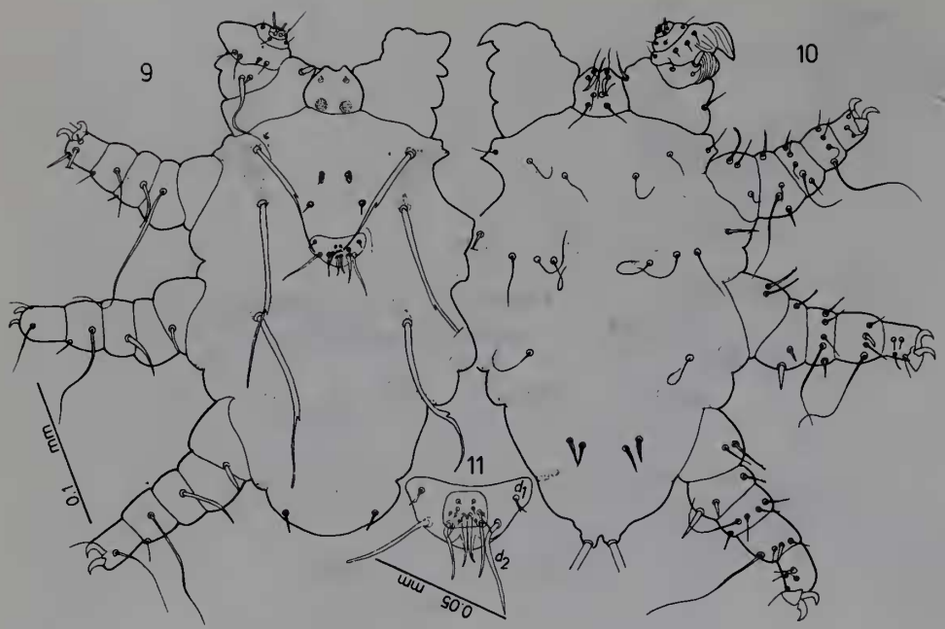
The holotype is deposited in the collection of the BMNH (BM 1987.9.9.4).

DIAGNOSIS. *Pteracarus genualis* sp. nov. is characterized by the thickened and spiniform dorsal seta on genua II–IV, a character that has not been found in other species. The paired setae ventrally in coxal region IV, ic_4 and *cx* IV, are different from each other in the present new species. Such a pair of setae is found only in *Pteracarus completus vrazi* Dusbábek and Wilson (Dusbábek, 1973).

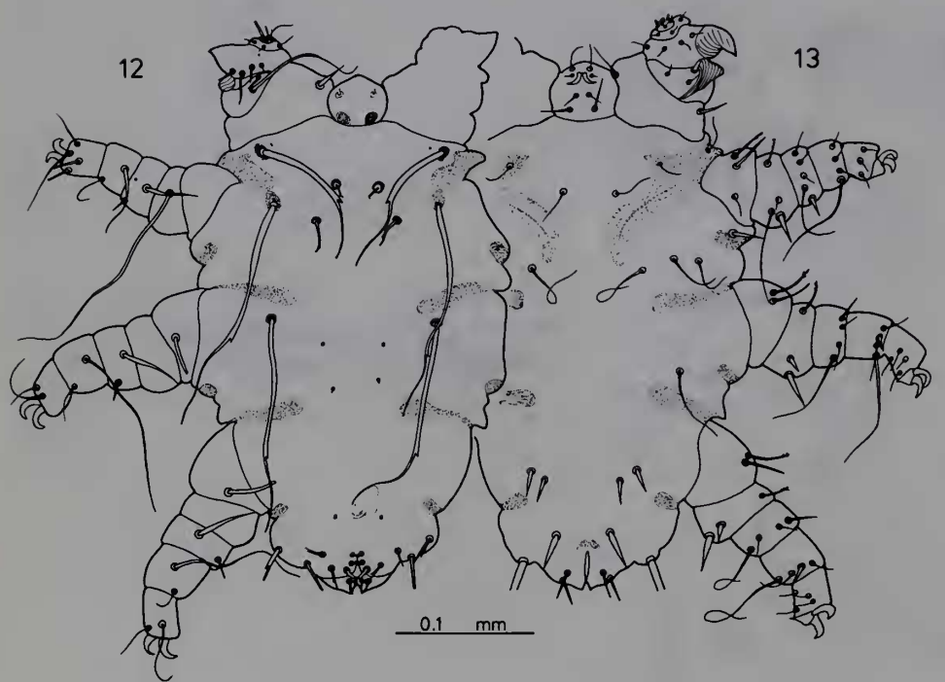
The specific name *genualis* is adopted in contrast with *tibialis* that indicates tibiae III and IV each bearing a stout, lanceolate and striated dorsal seta in the female.

Pteracarus histotis sp. nov.

MALE (Figs 9, 10 & 11). Gnathosoma shorter than wide dorsally. Setae *vi* inferior in size to *sc i*; *ve, sc e* and l_1 long; d_2 long. Genital shield distinctly posterior to basal level of *sc e*,



Figs 9–11 *Pteracarus histotis* sp. nov.: **male** dorsum (9); venter (10); genital shield (11).



Figs 12–13 *Pteracarus histotis* sp. nov.: **female** dorsum (12); venter (13).

bearing four pairs of minute setae, a pair of moderate setae, two pairs of long setae and barbed d_1; penis long. Ventral setae of coxal regions I–III fine and long; ic_4 and *cx* IV spiniform and striated; ic_4 slightly thinner than *cx* IV. Leg I with terminal claws; antero-lateral seta on coxae II–IV and femora II–IV weakly barbed; the two ventral setae on femora III and IV setiform.

MEASUREMENTS. Body 320 long by 190 wide; *vi* 4; *ve* 78; *sc i* 6; *sc e* 125; l_1 120; l_3 13; d_1 6; d_2 35; longest genital seta 21; penis *ca.* 195; ic_4 15; *cx* IV 18.

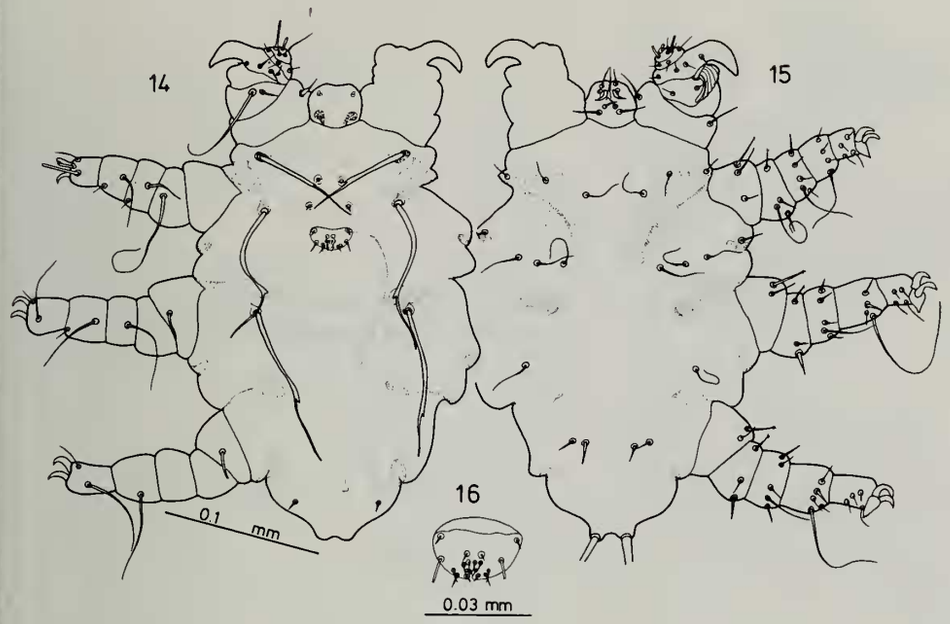
FEMALE (Figs 12 & 13). Setae *vi* distinctly shorter than *sc i*; *ve, sc e* and l_1 long; d_1–d_3 vestigial; d_4 conspicuous, slightly shorter than d_5; l_3 shorter than l_4; ic_4 and *cx* IV subequal in size. Spermatheca as in Fig. 12. Other characters as in the male.

MEASUREMENTS. Body 380 long by 220 wide; *vi* 12; *ve ca.* 110; *sc i* 26; *sc e ca.* 175; d_4 11; d_5 15; l_1 *ca.* 165; l_3 23; l_4 25; ic_4 20; *cx* IV 23.

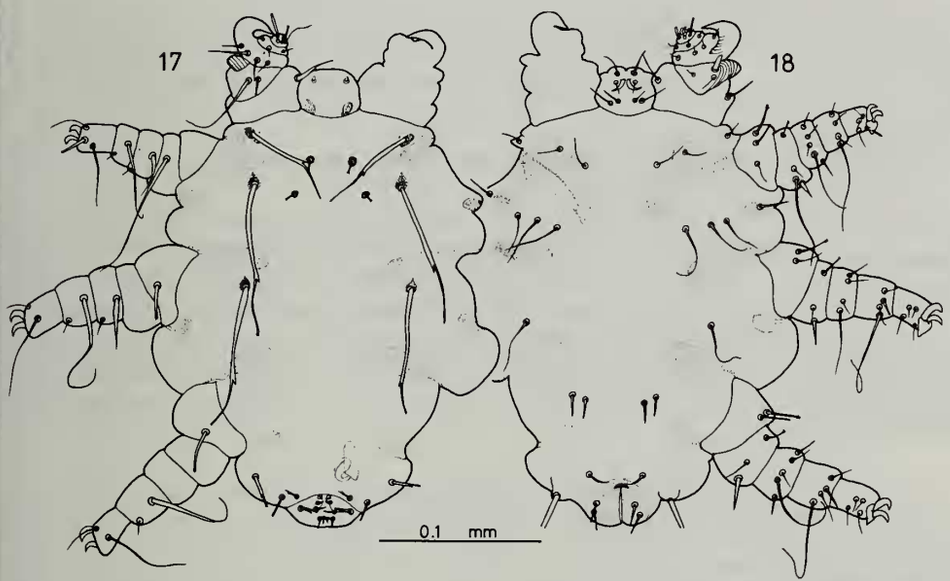
MATERIAL EXAMINED. Holotype male and allotype female ex *Histiotus macrotus*, Jujuj, Argentina, date uncertain (USNM 10105).

The types are deposited in the collection of the USNM.

DIAGNOSIS. *Pteracarus histotis* sp. nov. shares more characters with *Pteracarus aculeus* Dusbábek & Lukoschus than with any other member of the genus. However, both species are



Figs 14–16 *Pteracarus pizonychos* sp. nov.: **male** dorsum (14); venter (15); genital shield (16).



Figs 17–18 *Pteracarus pizonychos* sp. nov.: **female** dorsum (17); venter (18).

easily distinguished from each other by differences in the genital shield and setae on it in the male. The number of genital setae is more, the longest genital setae are longer and d_2 is much longer in *P. histotis* than in *P. aculeus*. In the female, setae *vi* are distinctly shorter than *sc i* in *P. histotis*, while these setae are subequal in length in *P. aculeus*.

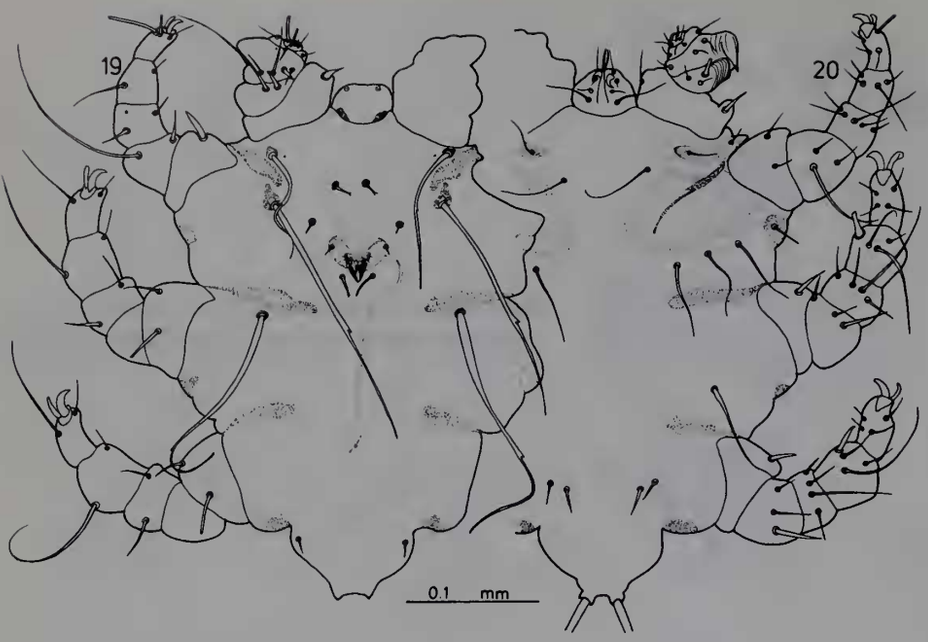
II. Mites without dorsal seta on genu IV (a total of five setae) (Dusbábek, 1973), and with d_4 and d_5 in the female.

Pteracarus pizonychos sp. nov.

MALE (Figs 14, 15 & 16). Gnathosoma almost as long as wide. Setae *vi* minute; *sc i* more conspicuous than *vi*, situated on asal level of *sc e*; *ve, sc e,* l_1 long and similar to one another; l_3 weak; ventral setae not so strong; ic_4 and *cx* IV setiform. Genital shield situated distinctly posterior to basal level of *sc e*, bearing seven pairs of genital setae; d_1 much shorter than postero-median genital seta; penis long and rather thin. Leg I with a pair of terminal claws; paired claws on legs II–IV subequal in size to each other; antero-lateral seta on coxae II–IV and femora II–IV barbed apically.

MEASUREMENTS. Body 290 (holotype)–280 (paratype) long by 175–165 wide; *vi* 3–3; *ve* 68–67; *sc i* 4–5; *sc e ca.* 85–93; l_1 95–93; l_3 6–6; d_1 3–3; d_2 6–8; penis *ca.* 175–*ca.* 170; ic_4 11–10; *cx* IV 8–8.

FEMALE (Figs 17 & 18). Idiosoma rounded. Setae *vi* and *sc i*



Figs 19–20 *Pteracarus pipistrellius maximis* ssp. nov.: **male** dorsum (19); venter (20).

subequal; d_1–d_3 lacking on allotype and 2 paratypes but only d_3 discernible on the third paratype; d_4 well developed, inferior in length to d_5; l_3 distinctly longer than l_4. Spermatheca as in Fig. 17. Other characters as in the male.

MEASUREMENTS. Body 360 (allotype) (360–390, 3 paratypes) long by 270(260–280) wide; *vi* 9(8–10); *ve* 82(83–91); *sc i* 8(7–8); *sc e* 115(128–140); l_1 112(120–125); l_3 28(30–34); l_4 24(20–23); d_4 14(13–13); d_5 15(17–20); ic_4 15(15–17); *cx* IV 14(13–13).

MATERIAL EXAMINED. Holotype male, allotype female, a paratype male and three paratype females ex *Pizonyx vivesi*, Partida Is., Lower California, U.S.A., 9–III–1936 (USNM 260575–80).

The holotype, allotype and a paratype female are deposited in the USNM collection; a paratype female is in the collection of the BMNH (BM 1987.9.9.5); and a pair of male and female paratypes are in the collection of the author.

DIAGNOSIS. *Pteracarus pizonychos* sp. nov. is allied to *Pteracarus minutus* sspp. in having the same type of male genital shield. However, the genital shield is situated more posteriorly and bears distinctly shorter d_1 in the new species than in *P. minutus* sspp. Measurements for both sexes are larger in *pizonychos* than in *P. minutus* sspp. Moreover, the barbed antero-lateral seta on coxae and femora II–IV of *P. pizonychos* is not found in *P. minutus* sspp.

Females of all the preceding species bear d_1–d_5 dorsally on the idiosoma. In *P. pizonychos*, setae d_1–d_3 are lacking, while d_4 and d_5 are well developed. However, setae d_3 are discernible exceptionally on a single paratype, suggesting that the regression of d_1–d_3 is incomplete and that mites with only d_4 and d_5 are not so far from those with d_1–d_5 phylogenetically. Accordingly, the presence of d_4 and d_5 seems to have the same meaning as the *d* series of setae being complete.

The six species, *P. compactus* Fain, *P. faini* Uchikawa, *P. miniopteri* Uchikawa, *P. minutus* sspp., *P. peruvianus* Fain and *P. tibialis* Dusbábek, and *P. pizonychos* belong to the group with five setae on genu IV. All these species lack d_1–d_3 and bear d_4 and d_5. It is reasonable to presume that dorsal setae on genu IV and d_1–d_3 have disappeared from the type with six setae on genu IV and d_1–d_5 on the idiosomal dorsum.

III. Mites with a dorsal seta on genu IV (a total of six setae); *d* series lacking d_5 in the female (Dusbábek, 1973).

Pteracarus pipistrellius maximis ssp. nov.

MALE (Figs 19 & 20). Gnathosoma shorter than wide. Setae *vi* superior in size to *sc i*; *sc i* situated posterior to bases of *sc e*; *ve*, *sc e* and l_1 long; l_3 minute; ventral setae ic_4 and *cx* IV spiniform. Genital shield bearing two pairs of minute setae, two pairs of modified postero-median setae and d_1; d_2 off the shield; penis curved distally. Leg I with a pair of terminal claws; paired claws on legs II–IV unequal in size to each other.

MEASUREMENTS. Body 390 long by 250 wide; *vi* 11; *ve ca.* 103; *sc i* 10; *sc e* 205; l_1 *ca.* 190; l_3 12; d_1 8; d_2 22; penis *ca.* 168.

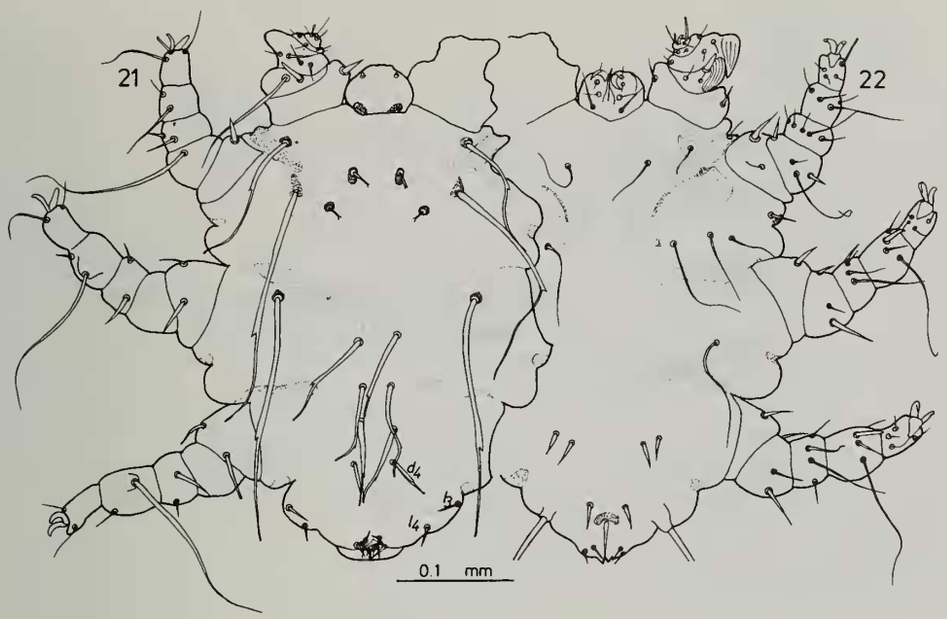
FEMALE (Figs 21 & 22). Dorsal setae d_1–d_4 long; d_4 situated almost on posterior level of leg IV. Other characters as in male.

MEASUREMENTS. Body 430 (allotype) (420–430, two paratypes) long by 290(290–290) wide; *vi* 15(13–15); *ve ca.* 125(120–120); *sc i* 13(10–13); *sc e* 210(228–208); d_1 92(90–95); d_2 75 (73–85); d_3 73(67–73); d_4 40(45–41); l_1 205(210–208); l_3 15(15–15); l_4 17(16–18); ic_4 23(23–23); *cx* IV 18(20–18).

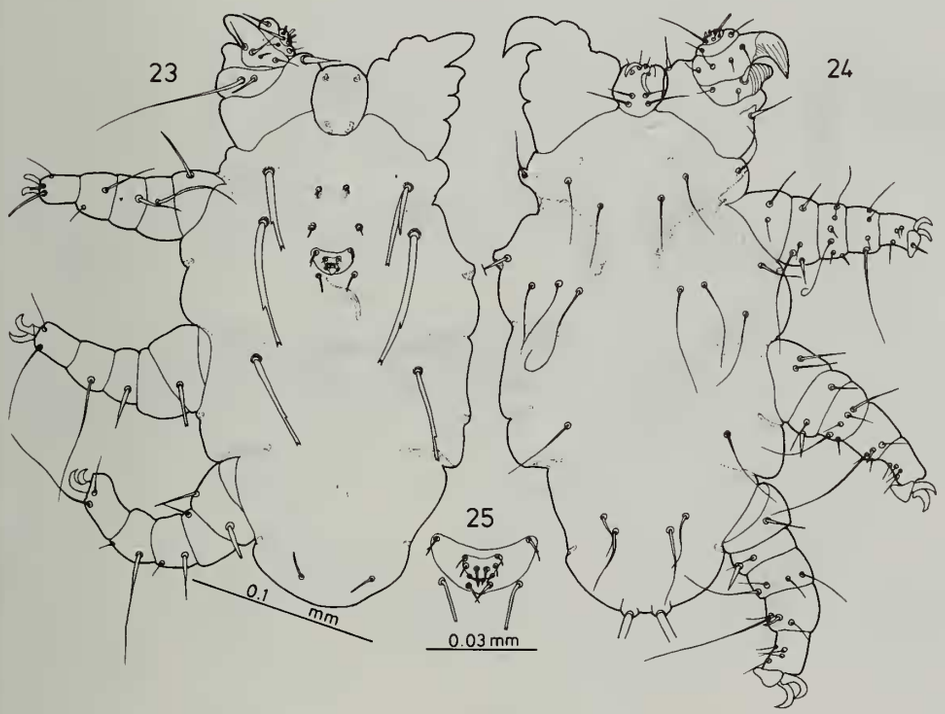
MATERIAL EXAMINED. Holotype male, allotype female and a paratype female ex *Nyctalus maximus*, Pisa, Italy, date uncertain (USNM 86623–4); a paratype female ex *Nyctalus lasiopterus*, Creuse, France, date uncertain.

The holotype and allotype are deposited in the USNM collection; a paratype female is in the collection of MNHN; and a paratype female is in the collection of the author.

DIAGNOSIS. Those mites with the male genital shield as described above and with setae d_1–d_4 in the female long and



Figs 21–22 *Pteracarus pipistrellius maximis* ssp. nov.: **female** dorsum (21); venter (22).



Figs 23–25 *Pteracarus mimetillius* sp. nov.: **male** dorsum (23); venter (24); genital shield (25).

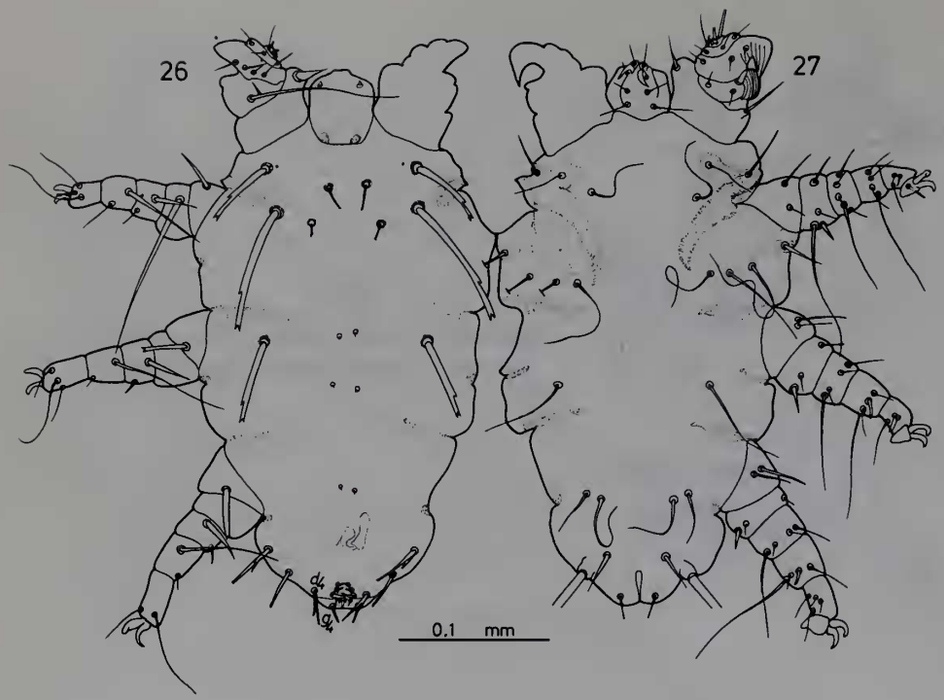
arranged unusually within the region of legs IV are regarded as subspecies of *Pteracarus pipistrellius* (Radford) (Dusbábek, 1973). The nominate subspecies and subspecies *tenax* Jameson & Chow have been proposed on the basis of setal lengths. *Pteracarus pipistrellius maximus* ssp. nov. is differentiated from those two subspecies by its larger measurements for the body, *ve, sc e* and l_1 of both sexes and for d_1, d_2 and d_3 of the female. Dorsal seta *sc i* is situated posterior to the basal level of *sc e* in the male of the present subspecies, while the corresponding seta is on the basal level of *sc e* in both the nominate subspecies and *tenax*.

The hosts of *P. pipistrellius maximis* from Italy and France were differently named in the collections of the two museums as recorded above, but it is highly probable that they are conspecific.

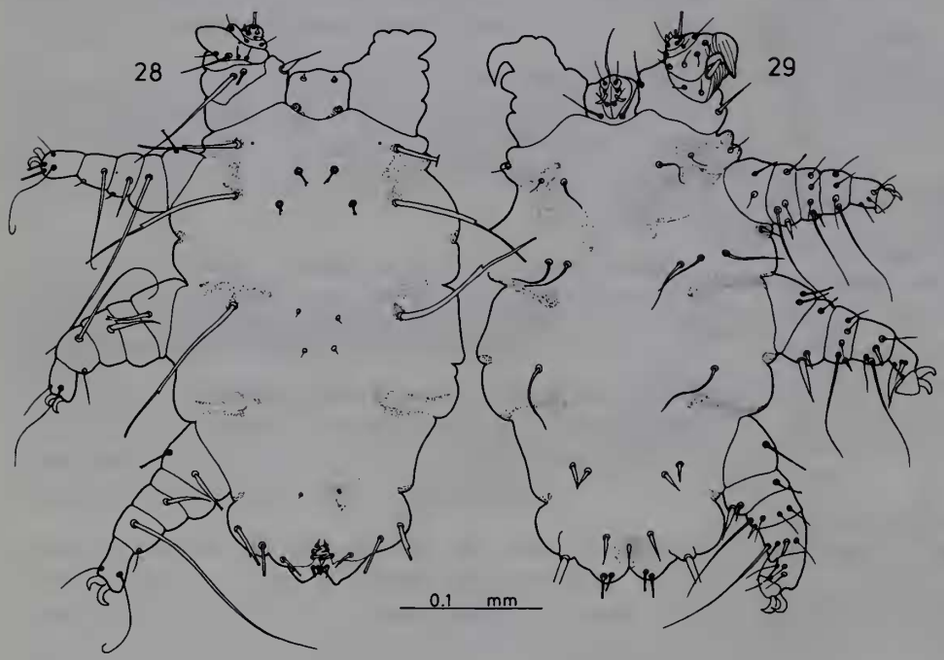
Pteracarus mimetillius sp. nov.

MALE (Figs 23, 24 & 25). Gnathosoma longer than wide. Setae *vi* minute, inferior in size to *sc i*, d_1 or d_2; *sc i* situated almost on basal level of *sc e*; *ve, sc e* and l_1 thick and relatively short, barbed and apically bifurcated; all ventral setae, inclusive of ic_4, *cx* IV and *cx* II 3, setiform, fine and long. Genital shield bearing six pairs of genital setae and d_1; d_2 off shield; penis long. All legs stout; leg I with a pair of terminal claws; paired claws on legs II–IV subequal in size to each other.

MEASUREMENTS. Body 285 (holotype)–260 (paratype) long by 150–150 wide; *vi* 3–4; *ve* 47–48; *sc i* 5–5; *sc e* 71–80; l_1 50–53; l_3 18–18; d_1 8–8; d_2 14–15; penis *ca.* 155–*ca.* 140.



Figs 26–27 *Pteracarus mimetillius* sp. nov.: **female** dorsum (26); venter (27);.



Figs 28–29 *Pteracarus nycticeius* sp. nov.: **female** dorsum (28); venter (29).

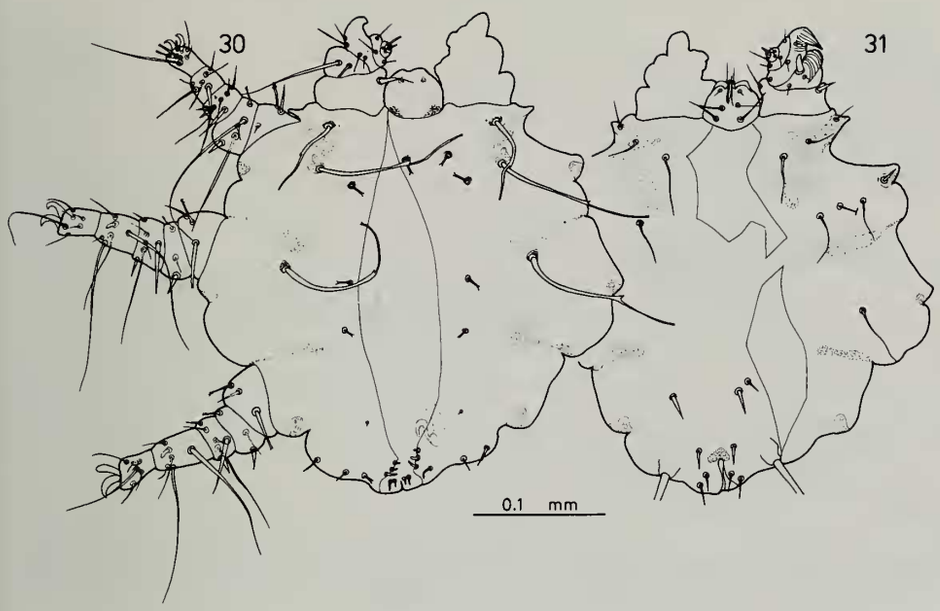
FEMALE (Figs 26 & 27). Setae *vi* distinctly longer than *sc i*; d_1–d_3 vestigial; d_4, l_3 and l_4 well developed. Spermatheca as in Fig. 26. Other characters as in the male.

MEASUREMENTS. Body 365 (allotype) (360–380, four paratypes) long by 200(190–210) wide; *vi* 20(15–19); *ve* 54(55–60); *sc i* 12(9–12); *sc e* 92(88–98); d_4 28(25–28); l_1 63(63–70); l_3 35(30–35); l_4 29(30–41).

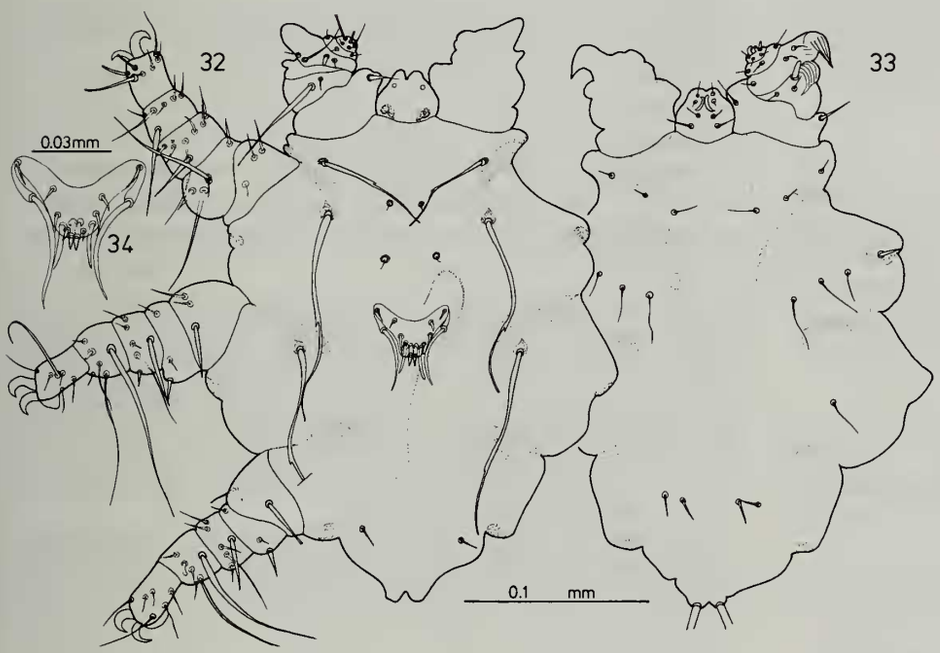
MATERIAL EXAMINED. Holotype male, allotype female and three paratype females ex *Mimetillus moloneyi*, La Maboki, Republic of Central Africa, 1965, in the collection of MNHN; a male paratype ex *M. moloneyi*, Bo, Sierra Leone, date uncertain (BM 60.304–6); and a female paratype ex *M. moloneyi*, date uncertain (BM 64.1786–8).

The holotype and allotype are deposited in the collection of the MNHN; a pair of male and female paratypes is in the collection of the BMNH (BM 1987.9.9.6–7); and three paratype females are in the collection of the author.

DIAGNOSIS. Among the known species of the genus *Pteracarus*, *P. charinolobus* (Womersley), *P. microdorsalis* Fain & Lukoschus and the preceding species, *P. pipistrellius* (Radford), are characterized by lacking d_5 dorsally on the female idiosoma. *Pteracarus mimetillius* sp. nov. is easily differentiated from the above three species by its unique setae on the idiosomal venter. Thick, relatively short and apically bifurcated setae *ve*, *sc e* and l_1 of both sexes are also characteristic of the new species.



Figs 30–31 *Pteracarus brevis* sp. nov.: **female** dorsum (30); venter (31).



Figs 32–34 *Pteracarus tylonycteris* sp. nov.: **male** dorsum (32); venter (33); genital shield (34).

Pteracarus nycticeius sp. nov.

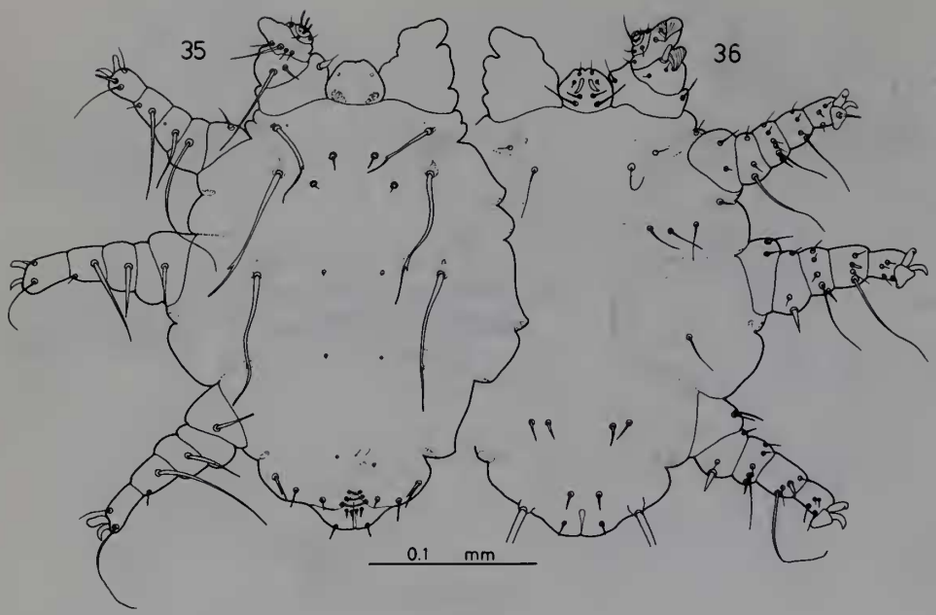
FEMALE (Figs 28 & 29). Gnathosoma wider than long. Setae *vi* superior in size to *sc i*; *sc i* almost on basal level of *sc e*; *ve*, *sc e* and l_1 relatively short and rather slender; d_1–d_3 minute; d_4 well developed but distinctly shorter than l_3 and l_4; ventral setae ic_4 and *cx* IV spiniform. Spermatheca as in Fig. 28. Leg I with a pair of claws; paired claws on legs II–IV subequal in size to each other; spines ventrally on femora II–IV 1, 2 and 2, respectively; antero-lacteral seta on coxae II–IV and femora II–IV weakly barbed apically. Male unknown.

MEASUREMENTS. Body 365 (holotype) (355–420, four paratypes) long by 205(220–240) wide; *vi* 12(10–10); *ve* 75(78–83); *sc i* 10(8–10); *sc e* 120(112–123); d_4 17(14–17); l_1 120 (115–130); l_3 33(28–28); l_4 28(22–25); ic_4 17(18–20); *cx* IV 17(16–18).

MATERIAL EXAMINED. Holotype female and four paratype females ex *Nycticeius schliefferi*, Boutilimit, Pays Trarza, Sahara, Mauritanie, date uncertain, in the collection of MNHN.

The holotype and a paratype are deposited in the collection of MNHN and 1 and 2 paratypes are in the collections of the BMNH (BM 1987.9.9.8) and the author, respectively.

DIAGNOSIS. *Pteracarus nycteceius* sp. nov. resembles *P. microdorsalis* among the mites belonging to a group lacking dorsal seta d_5. The new species is distinct in having two spines ventrally on femora III and IV instead of one each on those segments as in *P. microdorsalis*.



Figs 35–36 *Pteracarus tylonycteris* sp. nov.: **male** dorsum (35); venter (36).

Since two ventral spines on femora III and IV are found only in *P. aculeus* Dusbábek & Lukoschus, parasitic on *Eptesicus* spp., and *P. histotis*, both of which are known from both sexes, the partner male of *P. nycteceius* may be easily identified on the basis of this character and host record.

Pteracarus brevis sp. nov.

FEMALE (Figs 30 & 31). Gnathosoma wider than long. Idiosoma as long as wide; *vi* and *sc i* short yet conspicuous; *ve, sc e* and l_1 long; d_1 and d_2 conspicuous; d_3 minute; d_4, l_3 and l_4 conspicuous but short; ic_4 and *cx* IV spiniform. Spermatheca as in Fig. 30. Leg I with a pair of terminal claws; antero-lateral seta on trochanters II–IV and femora II–IV barbed.

MEASUREMENTS. Body *ca.* 330 long; *vi* 12; *ve* 65; *sc i* 12; *sc e ca.* 120; d_1 8; d_2 6; d_4 8; l_1 *ca.* 125; l_3 15; l_4 15; ic_4 18; *cx* IV 13.

MATERIAL EXAMINED. Holotype female (damaged) ex *Philetor brachypterus verascundus*, Kempas, Paloh, Klang, Johore, Malaya, 8–V–1970 (AM 247518–25).

The holotype is deposited in the collection of the Department of Entomology, AMNH.

DIAGNOSIS. *Pteracarus brevis* sp. nov. is distinct in having the idiosoma as long as wide, a feature that is lacking in all other known species of the genus *Pteracarus*.

Pteracarus tylonycteris sp. nov.

MALE (Figs 32, 33 & 34). Gnathosoma wider than long. Setae *vi* just anterior to basal level of *sc e*, minute; *sc i* distinctly posterior to basal level of *sc e*; *ve, sc e* and l_1 long; ventral setae ic_4 and *cx* IV spiniform. Genital shield closer to basal level of l_1 than to that of *sc e*; bearing six pairs of genital setae, d_1 and d_2; d_2 relatively long; penis sinuate. Leg I with a pair of terminal claws; paired claws on legs II–IV unequal in size to each other.

MEASUREMENTS. Body 290 long by 210 wide; *vi* 3; *ve* 60; *sc i* 4; *sc e ca.* 110; l_1 108; l_3 11; d_1 8; d_2 45; ic_4 13; *cx* IV 13; penis *ca.* 160.

FEMALE (Figs 35 & 36). Setae *vi* slightly longer than *sc i*; *vi* distinctly anterior to basal level of *sc e*; *sc i* slightly posterior to basal level of *sc e*; d_1–d_3 vestigial d_4 conspicuous but much inferior in size to l_3 and l_4; l_3 and l_4 relatively short. Spermatheca as in Fig. 35. Other characters as in the male.

MEASUREMENTS. Body 310 (allotype) (200–300, two specimens) long by 245(215–220) wide; *vi* 10(10–8); *ve* 65(60–55); *sc i* 7(8–7); *sc e* 110(110–98); d_4 8(7–6); l_1 108(115–92); l_3 18(23–18); l_4 18(22–15); ic_4 14(13–13); *cx* IV 10(10–12).

MATERIAL EXAMINED. Holotype male and allotype female ex *Tylonycteris pachypus*, Pertjut Medan, Sumatra, 1970 (SMF 39455–674); one female from the same host, Perak, Malaya, 24–I–1971 (AM 236207–11); one female from the same host, Ulu Langat Forest Reserves, Kajang, Selangor, Malaya (BM 60.1405–20); one female ex *Tylonycteris* sp. from Thailand as in Uchikawa & Kobayashi (1978).

All four specimens have been returned to the museums from which they were originally obtained, whilst the Thai specimen is in the collection of the author.

DIAGNOSIS. Dusbábek (1973) described the male of a valid but anonymous species, *Pteracarus* sp. E, taken from *Tylonycteris robustula* in Malaysia. *Pteracarus tylonycteris* sp. nov. resembles his species, yet is differentiated from the latter by specific arrangement of genital setae on the male genital shield as well as longer *ve*. The nature of the extero-dorsal seta on femur I is also different in the two species.

Uchikawa and Kobayashi (1978) recorded a female of a *Pteracarus* species taken from *Thylonycteris* in Thailand. Although dorsal setae d_1–d_3 are lacking in the original figure (Uchikawa & Kobayashi, 1978, Fig. 16), these setae are discernible on that specimen, and measurements for all parts are within the ranges for the above allotype and two other females. Thus, their specimen is identifiable as the female of *P. tylonycteris*.

Table 1 Sorting of the 21 previously known and nine new species of the genus *Pteracarus* according to the chaetotaxy on genu IV and dorsally on female opisthosoma.

Dorsal seta on genu IV	d_1–d_3	d_5	Species
+	+	+	*aculeus, completus, robustus, submedianus, shealsi, macfarlanei, hesperoptenis*, rhogeeis*, genualis*, histotis**
		–	*chalinolobus, pipistrellius, microdorsalis, breviatus‡, mimetillius*, nycticeius*, brevis*, tylonycteris**
	–	+	*elegans*
–	–	+	*compactus, dusbabeki, faini, miniopteri, minutus, mirabilis, pervianus, pusillus, tibialis†, pizonychos**

* New species.
† Based only on the female. *P. holubi* is known only from the male belonging to a group with a dorsal seta on genu IV.
‡ Setae d_5 of *P. breviatus* in the original description are g_4 in reality as shown in figs 5–6 in Fain & Aellen, 1979*b*.

DISCUSSION

Dusbábek (1973) reviewed 14 species of the genus *Pteracarus*, inclusive of two, three and two subspecies of *P. completus* Dusbábek and Wilson, *P. minutus* (Radford) and *P. pipistrellius* (Radford), respectively, and listed a further seven anonymous species (Spp. A–G). Of those named and unnamed species, *P. scutulatus* Fain and Coffee was synonymized with *P. pusillus* (Lawrence) (Fain, 1978*a*); *Pteracarus* sp. A was regarded as being conspecific with *P. chalinolobus* (Womersley) (Fain & Lukoschus, 1979); and *Pteracarus* sp. F was named *P. dusbabeki* by Uchikawa *et al.* (1980). Morphologically, the male and female of *P. tibialis* Dusbábek were shown to have different chaetotaxies on leg IV. Since both sexes usually share the same leg chaetotaxy, it is necessary to re-examine the males from the type host. In this connection, the males recorded by Dusbábek (1973) had been taken not from the type host, *Myotis myotis* (Dusbábek, 1970), but from *Nyctalus noctula*.

The species or subspecies that have been added to the above are as follows: *P. shealsi* Fain, 1973*b*; *P. macfarlanei* Fain, 1973*b*; *P. peruvianus* Fain, 1978*b*; *P. faini* Uchikawa, 1978*a*; *P. pusillus thailandensis* Uchikawa & Kobayashi, 1978; *Pteracarus* sp. (female) Uchikawa & Kobayashi, 1978 (=*P. tylonycteris* sp. nov.); *P. miniopteri* Uchikawa, 1978*b*; *P. microdorsalis* Fain & Lukoschus, 1979; *P. minutus japonicus* Uchikawa, 1979; *P. breviatus* Fain & Aellen, 1979*b*; *Pteracaras* sp. 1 (? = *P. mirabilis*, ? = sp G in Dusbábek, 1973); and sp. 2 (Fain & Aellen, 1979*a*). Thus, the 21 named species, several subspecies within four species and a total of 4–7 unnamed species have so far been assigned to the genus *Pteracarus*.

Dusbábek (1973) adopted the chaetotaxy of genu IV and of the female idiosomal dorsum as useful characters in the classification of *Pteracarus*. Using those characters, the 30 full species, that is, 21 known and nine new species, are dividied into three groups as in Table 1. It is an interesting fact that the absence of dorsal seta on genu IV and d_1–d_3 and the presence of d_5 seem to be linked characteristics. On the other hand, mites with a dorsal seta on genu IV bear borsal setae d_1–d_3, with the exception of *P. elegans*, yet presence or absence of d_5 is variable according to species (Table 1). It is still necessary to confirm the presence of a strange setation on the idiosomal dorsum in the female of *P. elegans*, since vestigial d_1–d_3 are often very difficult to observe. Although phylogenetic meanings of differences in the leg and dorsal chaetotaxies are not yet clear, the above grouping of *Pteracarus* species is useful as the first stage of sorting the taxa from one another and for making a key to species.

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